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Cytec Industries Inc
Patent Law Department
1937 West Main Street
P O Box 60
Stamford, CT 06904

EXAMINER

BALASUBRAMANIAN, VENKATARAMAN

ART UNIT

PAPER NUMBER

1624

DATE MAILED: 07/02/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/779,604

Applicant(s)

GUPTA ET AL.

Examin r

Venkataraman Balasubramanian

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Applicants' response, which included amendment to claims 1-2,4-5, 16 and addition of new claims 20-31, filed on 9/23/2002, is made of record.

Claims 1-31 are now pending.

In view of applicants' response, the following apply.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention for reasons of record. Any claim not specifically rejected is rejected as being dependent on a rejected claim. To repeat:

1. Recitation of the term "reaction promoter" in claim1 and other dependent claims, renders these claims indefinite. The definition of this term in specification includes a variety of compounds including solvents and the proviso at the end of claim 1 appears to exclude solvents. It is not clear what is embraced as "reaction promoter". Furthermore, there is no guidance as to when a solvent is not a "reaction promoter" since often the polarity of the solvent influence the reaction. In addition, one trained in the art may use a mixture of solvents and it is not clear in such situation what protection is sought. Also reading claim 4 one would assume that solvent are indeed "reaction promoter". This is further supported by

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the fact that applicants are claiming "ether" as reaction promoter and then ether as solvent in claim 5.

Applicants' argument to overcome this rejection is not persuasive.

It is not clear whether a solvent would not function as reaction promoter when present or should not function as reaction promoter. It is also not clear whether those solvent recited in the specification as reaction promoter cannot be used as solvent or no longer be deemed as solvent. Reading the specification it is clear that there is no such exclusion of solvent as reaction promoter or solvent for the reaction.

Hence this rejection is proper and is maintained.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The insertion of the proviso "the reaction promoter is different than solvent and the compound of Formula II" in paper # 6 is deemed as new matter. The proviso introduces a new concept that solvent is different from reaction promoter for which there is no support in the specification or examples. Applicants have indicated that the support for the proviso is "found throughout the specification especially in examples" but careful consideration indicates that there is no

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support. The fact that examples use a promoter different from the solvent does not support the new concept that solvent is different from reaction promoter.

Claims 1-31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for protic acid, phenols as reaction promoter, does not reasonably provide enablement for solvent as reaction promoter. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The following apply. Any claim not specifically rejected is rejected as being dependent on a rejected claim and hence embraces the same limitation of independent claim.

In evaluating the enablement question, following factors are considered. Note *In re Wands*, 8 USPQ2d 1400 and *Ex parte Forman*, 230 USPQ 546. The factors include: 1) The nature of the invention, 2) the state of the prior art, 3) the predictability or lack thereof in the art, 4) the amount of direction or guidance present, 5) the presence or absence of working examples, 6) the breadth of the claims, and 7) the quantity of experimentation needed.

1. The nature of the invention and the state of the prior art:

The invention is drawn to a process of making compound of formula III using a Lewis acid in conjunction with a reaction promoter. Specification is not adequately enabled as to how to make compounds of formula III when reaction promoter is same as solvent or the reactant. The proviso in claim 1 recites reaction promoter is different from solvent or reactant and thereby excludes solvent and reactants as reaction promoter when present. But the definition of reaction promoter in specification pages

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20-25 includes both solvent and reactant as reaction promoter. Even combination of solvents is permitted as seen on page 26. Hence it is not clear if solvent recited in the reaction promoter list if present would be functioning as reaction promoter or it would not function as reaction promoter. Also as seen from the examples in specification solvent, for example chlorobenzene, appears not to promote the reaction. Hence it is not possible for one trained in the art to select solvent as he would not be sure whether it would be a reaction promoter or just a solvent. Similarly, if one were use resorcinol or meta hydroxy anisole as reactant would it be deemed as reaction promoter given the fact that the examples show resorcinol as reaction promoter. Specification offers no teachings or suggestion as to how to perform the process in presence of these reactants/ solvents. One trained in the art had to experiment extensively to arrive at combinations of reactants and solvents without reaction promoter activity and even if one trained in the art arrived at a such combination, it is not clear how that could be applicants' invention

2. The predictability or lack thereof in the art:

Hence the process as applied to the above-mentioned reactants/solvents devoid of reaction promoter activity claimed by the applicant is not an art-recognized process and hence there should be adequate enabling disclosure in the specification with working example(s).

4. The amount of direction or guidance present:

Examples illustrated in the experimental section or written description offer no guidance or teachings as to how perform the process of making compound of

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formula III when reactants/solvents are also reaction promoter and use of reaction promoter in such cases is beneficial not redundant.

5. The presence or absence of working examples:

Although examples shown on pages 31-61 show in the instant process, they are limited to examples wherein there is distinction between reactants/ solvents form reaction promoter. There are no representative examples showing the viability of the process for plurality of reactants/solvents, which may function as reaction promoter embraced in the instant claims.

6. The breadth of the claims:

Specification has no support, as noted above, for all reactants/ solvents generically embraced in the claim language would lead to desired compound of formula III given the fact the examples show reactants/solvents which are by definition reaction promoter but do not behave so as asserted by the comparative examples.

7. The quantity of experimentation needed:

The quantity of experimentation needed would be an undue burden on skilled art in the chemical art since there is inadequate guidance given to the skilled artisan for the many reasons stated above. Even with the undue burden of experimentation, there is no guarantee that one would get the product of desired structure, namely compound of formula III embraced in the instant claims in view of comparative art teachings.

Thus, factors such as "sufficient working examples", the "level of skill in the art

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and predictability, etc. have been demonstrated to be sufficiently lacking in the case for the instant claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritzsche et al. US 1,551,095 for reasons of record.

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hardy et al. US 3,118,887 in view of Fritzsche et al. US 1,551,095 for reasons of record.

These two rejections are same as made in the previous office action.

Applicants' traversal to overcome these rejections is not persuasive. However, to simplify examiner's answer, these rejections are withdrawn in favor of the following 103 rejection made in the previous office action and the issues raised in the traversal are addressed herein

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hardy et al. US 3,118,887 and Stevenson et al. US 6,242,598 in view of Fritzsche et al. US 1,551,095. for reasons of record. To repeat:

1. Determining the scope and contents of the prior art:

Hardy et al. teach a process for making tris aryl triazines which include tris resorcinylyl triazines claimed herein. See formula I and preferred formula II on col. 1-2. Note the definition of substituents in the aryl ring include hydroxy and alkoxy (ie. resorcinol and its derivatives) claimed herein. Note Hardy et al. teach the process of making these compounds on col.2 line 64-72 and col. 3 lines 1-13. Particularly, note Hardy et al. teaches, for unsymmetrical trisaryl substituted triazines, isolation of intermediates particularly, bisaryl chloro triazine as claimed herein. Note process involves the use of acid catalyst. Note Hardy et al teaches acid catalyst such as aluminum chloride. See col. 5-10 for the experimental conditions. Note the explicit

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teaching of one or more equivalents of the aromatic compound with cyanuric chloride and then use of the intermediate for further reaction. See Examples 2, 4, 8 and 12 for experimental details which includes solvents, Lewis acid and reaction conditions. Particularly see examples 2, 8 and 12. Note in example 2 and 8 carbon tetrachloride is used which qualifies as reaction promoter and as solvent for the reaction.

2. Ascertaining the differences between the prior art and the claims at issue:

Hardy differs from the instant claims by illustrating only use of aluminum chloride as acid catalyst for the reaction but not showing use of any other acid catalyst generically taught and not teaching use of these acid catalysts as reaction promoters.

3. Resolving the level of ordinary skill in the pertinent art:

The secondary reference, Fritzsche et al. teaches several tris aryl substituted triazines from cyanuric halide with α -naphthol and other aromatics in presence of condensing agents such as aluminum chloride or sulfuric acid in presence or absence of solvents. See formula shown on col. 1 and the definition of A and B. Note the definition of permits the process for making instant compound of formula III. Also note on line 33-38, Fritzsche et al. teaches the use of catalyst and solvents for the reaction. See example 1 and 2 where use aluminum chloride and sulfuric acid is taught respectively. Particularly note in example 2 the advantage of using sulfuric acid is taught. Note in example 3, use of tetrachloroethane is taught, which can be treated, according to instant specification, as a reaction promoter and solvent. See example 1 and 2 where use aluminum chloride and sulfuric acid is taught respectively.

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Instant claims differ from Fritzsche et al. in reciting a reaction facilitator for the reaction.

However, Fritzsche et al. teaches use of sulfuric acid to accelerate the reaction as well as a condensing agent for the reaction and tetrachloroethane as solvent for the reaction. But as noted before these are reaction promoters and with the Lewis acid used would constitute reaction facilitator. Furthermore, Fritzsche et al. teaches use of sulfuric acid or aluminum chloride as catalyst and advantage of using little sulfuric acid in the said reaction. Hence one trained in the art would be motivated to use aluminum chloride with sulfuric acid to accelerate the reaction.

Whereas Fritzsche et al. teaches explicitly sulfuric acid, there are no generic teachings to include all protic acids.

Stevenson et al. teaches use of several protic acids for the synthesis of structurally similar triazines. See col. 2, lines 13-21 wherein several protic acids are taught. Also note the reactions shown therein and note the equivalency of the active leaving groups include halogen, aryloxy and alkoxy. See lines 19-21. See entire document. In addition see col. 3 lines 1-7 for solvents for the reaction, col. 7, lines 20-35 for analogous art, col. 10, lines 48-65 wherein a combination of Lewis acid and protic acid is taught. Note the same on col. 14, lines 10-15, col. 15, lines 62-64, and col. 20, line 1-4. See examples 1-18 on col. 20-25 for process details.

Thus Stevenson clearly teaches a combination of protic acid with Lewis acid for the said triazine synthesis.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness:

Moreover, the processes taught by all these references are analogous.

Thus one having ordinary skill in the art at the time of the invention was made would have been motivated to combine both the primary and secondary references and employ the process taught by these prior art to the starting materials and reactants including the reaction conditions such as temperature and mole ratio etc. and expect to obtain the desired product because he would have expected the analogous starting materials and reactants react similarly. It has been held that application of an old process to an analogous material to obtain a result consistent with the teachings of the art would have been obvious to one having ordinary skill. Note *In re Kerkhoven* 205 USPQ 1069.

Applicants should note that this rejection is similar to the one made in the previous office action except for the format which now includes Wands Factors explicitly to show the factual basis for this rejection. In addition, the rejection is based on the fact that solvent/reactant can be used as reaction promoter and without applying the proviso due 112 first paragraph issues applied above.

Applicants' traversal is not persuasive for several reasons.

1. First of all applicants' argument that Hardy et al. does not teach asymmetrical triazines from cyanoaric halide lacks factual basis and is obviously a biased opinion. As can be seen on column 3, lines 1-25, which is also acknowledged by the applicants, Hardy teaches how to make asymmetrical triaryl-triazines from

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cyanuric halide. The fact that Hardy et al didn't provide an example does not negate the teaching. In addition, the wealth of prior art provided by the applicants in paper # 2, which is in record, clearly demonstrate that asymmetrical triazines can be made from cyanuric chloride. See Orban et al., to cite an example.

2. Applicants' argument to discredit Hardy et al., using Duennenberger et al., US 3,394,134 lacks factual basis.

First of all, Duennenberger et al., teaches monaryl-2,4-dichlorotriazine and the comments are therefore related to that class of compounds not compound of formula III which is as applicants would notice, is a diaryl-monohalo-triazine.

Secondly, as noted above, in the wealth prior art provide by the applicant includes several references, one of which Duennenberger et al. US 3,244,708, which teach diaryl-monochloro tirazines. See example 16. Also see Orban et al.

Hence, contrary to applicants' urging there is enough guidance available in the prior art to show that Hardy et al. teaching is enabled.

3. As for applicants' argument that Hardy et al. only teaches Lewis acid, applicants' attention is drawn to lines 9-15 of column 3, wherein Hardy et al teaches use of acid catalyst. It is not clear why one should limit the definition of an acid catalyst to only Lewis acid. Furthermore, the secondary reference Fritzsche et al. clearly equates Lewis acid with acid catalyst and teaches protic acid such as sulfuric acid. Thus the basis for limiting "acid catalyst" to Lewis acid only lacks factual support and contradicts one's knowledge of acid catalyst.

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4. As applicants' citation of Life technologies Inc., v. Clonetech Laboratories Inc., 56 USPQ 2d 1186, 1190, applicants should note that Fritzsche et al. states addition of little sulfuric acid would be beneficial and it is held that there is motivation for one trained in the art to combine a protic acid with other catalyst because one would ask why add sulfuric acid when there is copious evolution of HCl and therefore recognized that reaction is acid catalyzed and that initial stage presence of acid would accelerate the reaction.

In addition, one trained in the art having looked Stevenson et al, would know the beneficial effect of acid catalyst and would be motivated to combine Lewis acid with protic acid.

5. As for comparative results, the following apply.

It is not clear what prior art process is compared. It is not clear whether such comparison is done under identical conditions. For example, in the examples shown, amount of solvent used is often omitted and the solvent used is as per the reaction promoter definition is a reaction promoter and hence it is not clear whether the results shown are due solvent/reactant which by themselves function as reaction promoter or due to added reaction promoter. In this regards, applicants' attention is drawn to MPEP 716.02(e) and MPEP 2145 which states the following:

Comparison With Closest Prior Art

An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of

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obviousness. In re Burckel, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). "A comparison of the claimed invention with the disclosure of each cited reference to determine the number of claim limitations in common with each reference, bearing in mind the relative importance of particular limitations, will usually yield the closest single prior art reference." In re Merchant, 575 F.2d 865, 868, 197 USPQ 785, 787 (CCPA 1978) (emphasis in original). Where the comparison is not identical with the reference disclosure, deviations therefrom should be explained, In re Finley, 174 F.2d 130, 81 USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. In re Armstrong, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from example were inconsequential).

Comparisons when they are two equally close prior art references

Showing unexpected results over one of two equally close prior art references will not rebut prima facie obviousness unless the teachings of the prior art references are sufficiently similar to each other that the testing of one showing unexpected results would provide the same information as to the other. In re Johnson, 747 F.2d 1456, 1461, 223 USPQ 1260, 1264 (Fed. Cir. 1984).

6. Applicants' urging that Stevenson et al., is not a prior art as Stevenson et al., abandoned the parent application 09/033,266, is incorrect. Stevenson et al., is entitled to the priority date, 2 March 1998.

Hence the rejection is proper.

This action is not made FINAL.

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Reference cited in the Information Disclosure Statement (paper # 11) is made of record.

Conclusion

Any inquiry concerning this communication from the examiner should be addressed to Venkataraman Balasubramanian (Bala) whose telephone number is (703) 305-1674. The examiner can normally be reached on Monday through Thursday from 8.00 AM to 6.00 PM. The Supervisory Patent Examiner (SPE) of the art unit 1624 is Mukund Shah whose telephone number is (703) 308-4716.

The fax phone number for the organization where this application or proceeding is assigned (703) 308-4556.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1235.


Venkataraman Balasubramanian

6/29/2003